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TITLE: MILL-CONTAINING COFFEE BEVERAGE AND  
ITS PRODUCTION

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ABSTRACT:

PROBLEM TO BE SOLVED: To produce the subject beverage without any deterioration in flavor and taste even in a heated state for a long period by adding a monosaccharide and an amino acid to a coffee extract solution containing a saccharide and further formulating a milk component therewith, filling the resultant formulation in a container and carrying out the retort sterilization thereof.

SOLUTION: This coffee beverage is obtained by adding a monosaccharide and an amino acid such as a combination selected from xylose and

glycine, glucose and  
glycine or xylose and alanine to a coffee extract solution  
containing a  
saccharide, further formulating a milk component therewith,  
filling the  
resultant formulation in a container and then carrying out  
the retort  
sterilization. The amount of the monosaccharide and amino  
acid added based on  
the total amount of the coffee beverage is preferably  
0.01-1.0 wt.% and the  
mixing molar ratio of the monosaccharide to the amino acid  
is preferably (1:2)  
to (2:1).

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(54) 【発明の名称】 ミルク入りコーヒー飲料およびその製造方法

(57) 【要約】

【解決手段】 糖分を含むコーヒー抽出液に、単糖およびアミノ酸からなる混合物ならびに乳成分を添加し、容器に充填後、レトルト殺菌することを特徴とする、ミルク入りコーヒー飲料およびその製造方法。

【効果】 本発明によれば、加温状態でも長期間にわたり香味劣化のないミルク入りコーヒー飲料が提供される。

## 【特許請求の範囲】

【請求項1】 糖分を含むコーヒー抽出液に、単糖およびアミノ酸を添加し、更に乳成分を配合し、容器に充填後、レトルト殺菌することを特徴とする、ミルク入りコーヒー飲料の製造方法。

【請求項2】 単糖およびアミノ酸の組み合わせが、キシロースとグリシン、グルコースとグリシン、またはキシロースとアラニンから選ばれる組み合わせである、請求項1記載の方法。

【請求項3】 単糖およびアミノ酸のコーヒー飲料全量に対する添加量が、0.01~1.0重量%である請求項1記載の方法。

【請求項4】 単糖およびアミノ酸の混合比が、1:2~2:1(モル比)である、請求項1記載の方法。

【請求項5】 糖分を含むコーヒー抽出液に、単糖およびアミノ酸を添加し、更に乳成分を配合し、容器に充填後、レトルト殺菌することを特徴とする、ミルク入りコーヒー飲料。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、加温状態でも長期間にわたり香味劣化のないミルク入りコーヒー飲料およびその製造方法に関する。

## 【0002】

【従来の技術】ミルク入りの缶コーヒーは冬場は加温状態(55~60℃)でも販売される通年商材であり、清涼飲料水の売り上げの中でも大きなウェイトを占めている。ミルク入り缶コーヒーは、常温では12カ月以上も品質が安定しているのに対し、加温状態におくと急速に製品の香味が劣化してしまうことが知られている。従って、ミルク入り缶コーヒーの香味を維持するためには、加温状態でも長期間保存しないよう、自動販売機で滞留している時間を管理し、一定期間経過後にはその製品を廃棄するなどの厳密な商品管理が行われているのが現状である。この加温状態におけるミルク入り缶コーヒーの香味劣化、具体的には香りの面では乳独特の劣化臭(すえ臭)の発生、味の面では乳独特のむれっぽい味の発生、乳成分のこく味(クリーミー感)の消失は、牛乳等の乳成分に含まれる乳脂肪やコーヒー油脂などが加温によって複雑な酸化反応を起こして変化することが原因であると考えられている。かかる加温中の乳脂肪の酸化反応を抑制するために、抗酸化剤を添加することが考えられるが、安全性が高く、天然物由来であって、しかもコーヒーの味に影響を与えない抗酸化剤は少なく、また味に影響を与えない程度の微量の添加では抗酸化力が期待できない。一方、糖-アミノ酸褐変物質、つまりメイラード反応生成物には抗酸化作用があることが知られている(特公昭61-40277号、特開平5-65482号公報)。例えばロイシンとキシロース、イソロイシンとキシロース、バリンとグルコースの褐変物質を利用して、油脂及び油脂含有

食品の酸化変敗を防止し、同時にそれらの風味を維持改善する試みがなされている(特公昭45-28899号公報)。

## 【0003】

【発明が解決しようとする課題】従って、本発明の目的は、加温状態でも長期間にわたり香味劣化のないミルク入りコーヒー飲料およびその製造方法を提供することにある。

## 【0004】

【課題を解決するための手段】本発明者らは、上記課題を解決するため鋭意研究を重ねた結果、抗酸化力が強く、かつコーヒーの味に影響を与えないことが期待されるメイラード反応生成物に着目し、このメイラード反応生成物をコーヒー抽出液に存在させることにより、加温状態におけるミルク入りコーヒー飲料の香味劣化を抑制できることを見だし、本発明を完成させるに至った。

【0005】すなわち、本発明は、糖分を含むコーヒー抽出液に、単糖およびアミノ酸を添加し、更に乳成分を配合し、容器に充填後、レトルト殺菌することを特徴とする、ミルク入りコーヒー飲料およびその製造方法である。以下、本発明を詳細に説明する。

## 【0006】

【発明の実施の形態】本発明において、ミルク入りコーヒー飲料に配合するコーヒー抽出液は、コーヒー焙煎豆を抽出して得られる。コーヒー豆の種類は、特に限定されないが、例えば、ブラジル、コロンビア、タンザニア、モカ等が挙げられる。コーヒー豆は1種でもよいし、または複数種をブレンドして用いてもよい。焙煎は通常の方法で行えばよく、焙煎の程度は所望する呈味により適宜調整すればよい。具体的には、焙煎を深くすると苦みが強くなり、焙煎が浅いと酸味が強くなる。コーヒー焙煎豆の抽出方法は、特に限定されないが、例えば熱水抽出で行う。

【0007】本発明において、ミルク入りコーヒー飲料に配合する乳成分は、具体的には、生乳、牛乳、全粉乳、脱脂粉乳、生クリーム、濃縮乳、脱脂乳、部分脱脂乳、れん乳等をいう。

【0008】本発明においてはコーヒー抽出液に単糖およびアミノ酸を添加する。単糖はグルコース、キシロース等が挙げられる。また、アミノ酸は、グリシン、アラニン、ロイシン、イソロイシン、バリン等が挙げられる。これらの単糖およびアミノ酸からなる混合物は、加熱によりメイラード反応生成物を生じるが、その組み合わせとしては、キシロースとグリシン、キシロースとアラニン、グルコースとグリシンが好ましい。

【0009】上記の単糖とアミノ酸の混合比は、例えば1:2~2:1(モル比)の割合で用いることが好ましく、両成分をコーヒー飲料全量に対して0.01~1.0重量%、好ましくは0.15~0.9重量%の割合で含有させる。

【0010】本発明においては、上記の単糖以外の糖分として、例えば、ショ糖、果糖ブドウ糖液糖、水飴、麥

芽糖、乳糖、パラチノース、各種オリゴ糖が用いられる。また、上記の単糖は、糖分全量に0.1～7.0重量%、好ましくは1.0～6.0重量%の割合で含有させる。

【0011】さらに、本発明におけるミルク入りコーヒー飲料には、副原料としてpH調整剤、乳化剤、香料等を添加することができる。pH調整剤は加熱殺菌による乳蛋白質の沈殿生成を防止できるものであれば特に限定はされないが、例えば重曹が好適に用いられる。乳化剤としては、加熱殺菌による乳蛋白質の沈殿生成や、脂肪の分離を防止できるものであれば特に限定されないが、例えばショ糖脂肪酸エステル、グリセリン脂肪酸エステル、微結晶セルロースが好適に用いられる。

【0012】本発明のミルク入りコーヒー飲料の製造方法としては、具体的には、コーヒー抽出液に所定量の糖分、例えばショ糖を加え溶解させた後、上記の単糖およびアミノ酸を添加して重曹にてpHを6.8～7.1に調整する。さらに、乳化剤を添加した後、乳成分、香料を加えコーヒー調合液とする。これを例えば60～70℃に昇温後、ホモゲナイズ処理し、さらに90℃に昇温後、容器に充填してレトルト殺菌する。レトルト殺菌は、例えば115～130℃、15～30分間、10～60Fにて行う。ここで使用される容器としては、例えば缶（アルミニウム、スチール）、瓶（ガラス）である。

【0013】上記のレトルト殺菌中に容器中で自動的に単糖とアミノ酸によりメイラード反応が起こり、メイラード反応生成物ができる。メイラード反応生成物は、予め別途調製しておき、これをコーヒー抽出液に添加し、その後レトルト処理を行ってもよいが、上記のようにレトルト殺菌中にメイラード反応生成物を調製するほうが、原料の調達や操作性の面から有効である。

#### 【0014】

【実施例】以下、本発明を実施例を挙げて具体的に説明するが、本発明はこれらに限定されるものではない。

【0015】〔実施例1〕 ミルク入りコーヒー飲料の製造

焙煎したブラジル豆を粉碎した後、攪拌を行いながら、14倍量の90℃の熱水で、15分間抽出を行った。抽出終了後、市販の紙製の濾過フィルターで抽出液を濾過し、濾液を氷冷した。得られた液（以下、コーヒー抽出液）の可溶性固形分（ブリックス；Brix）は2.3であり、抽出率は25%であった。このコーヒー抽出液を1000g処方でのコーヒー焙煎豆の使用量が52gになるように秤量した。この抽出液に、ショ糖を61g、キシロースを1.22g、グリシンを0.61g添加し完全に溶解した後、重曹を加えpHを6.9に調整した。これに乳化剤としてショ糖脂肪酸エステル0.3gを溶解した後添加した。次いで、牛乳を120g、香料を1g加えて調合液とした。この調合液をホモゲナイズ処理（1次圧150kg/cm<sup>2</sup>、2次圧50kg/cm<sup>2</sup>の計200kg/cm<sup>2</sup>）して均質化し、90℃に昇温後、缶に充填し、レトルト殺菌を行い（124℃、20分間、F=39）、目的

のミルク入りコーヒー飲料を得た。

【0016】〔試験例1〕 メイラード反応生成物の抗酸化能試験（1）

(1) メイラード反応生成物の調製

単糖としてキシロース（Xyl）またはグルコース（Glc）、アミノ酸としてグリシン（Gly）、アラニン（Ala）、イソロイシン（Ile）、ロイシン（Leu）、またはバリン（Val）をモル比で1:1になるように混合し、終濃度が25mMになるようにリン酸バッファー（pH7.0）を添加し、完全に溶解した。その後、124℃ 20分間の加熱を行い、メイラード反応を行った。加熱終了後、速やかに冷却した後、これをメイラード反応生成物とした。

(2) 過酸化価（P.O.V.）の算出

99.5% エタノール2ml、2.5%リノール酸/エタノール2ml、50mMリン酸バッファー（pH7.0）4mlに市販の抗酸化剤としてビタミンE、ブチルヒドロキシアニソール（BHA）、ブチルヒドロキシトルエン（BHT）、没食子酸プロピル（PG）を200ppm、及び上記のメイラード反応生成物を加え（単糖が1000ppmになるように）、全量を10mlにした後、スクリーバイアルに入れ、55℃で8日間保存し、これを試料液とした。保存したスクリーバイアルから試料液を0.05ml採取し、これを試験管に入れ、75% エタノールを4.85ml、30% チオシアン酸アンモニウム溶液を0.05ml加えた。これらの混合液に20mM塩化第一鉄/3.5%塩酸溶液0.05ml加え、15秒間攪拌し、正確に3分後に500nmの吸光度を測定した。この測定法は、ロダン液と塩化鉄とが反応し、生じた赤色物質（Fe<sup>3+</sup>（SCN）<sub>3</sub>）を比色定量するもので、別に作成したFeの標準直線よりFe量を換算し、過酸化価（P.O.V.）として算出した。下記表1にその結果を示す。

#### 【0017】

【表1】

抗酸化性試験物質		過酸化価(P.O.V.)
(メイラード反応生成物)		
糖	アミノ酸	
	Gly	0.27
	Ala	0.27
	Leu	0.39
	Ile	0.35
Xyl	Val	0.32
	Gly	0.16
	Ala	0.36
	Leu	0.53
	Ile	0.84
Glc	Val	0.31
	コントロール	3.12
	BHT	0.17
	BHA	0.47
	PG	0.28

【0018】以上の結果より、メイラード反応生成物のうち、キシロース（Xyl）とグリシン（Gly）、グルコース（Glc）とグリシン（Gly）、キシロース（Xyl）とアラニン（Ala）の組み合わせが特に効果的であることがわかった。

【0019】〔試験例2〕メイラード反応生成物の酸化能試験(2)

キシロース(Xyl)とグリシン(Gly)を用いて下記表2の配合割合でコーヒー飲料を調製し、これを55℃で2カ月保存後、化学発光(CL)強度を測定した。化学発光 \*

\*(CL)強度は、試料室に飲料5mlを正確に計り入れ、これを40℃に保ち5分間に測定されるCLを積算することにより算出した。その結果を図1に示す。

【0020】

【表2】

	基本処方	Xyl-Gly 添加処方
コーヒー豆		52.0
牛乳		120.0
ショ糖		61.0
乳化剤		0.30
香料		1.00
重曹にてpH 6.9に調整		
キシロース(Xyl)	0	1.22
グリシン(Gly)	0	0.61
合計		1000

(単位:g)

【0021】図1により、Xyl-Gly 添加処方基本処方に比べて酸化の度合いが顕著に抑制されていることが示される。

※【0024】

【表4】

	Xyl	Gly
試料1	0	0
試料2	0.122	0.061
試料3	0.61	0.305
試料4	1.22	0.61
試料5	6.10	3.05
試料6	12.2	6.10

(単位:g)

【0022】〔試験例3〕ミルク入りコーヒー飲料の官能評価(1)

20

(1) 単糖とアミノ酸の使用量範囲

基本処方(表3)に、キシロース(Xyl)とグリシン(Gly)を表4に示す割合で添加し、試料を調製した。

【0023】

【表3】

(基本処方)	
ショ糖	61
殺菌乳	120
コーヒー豆	52
乳化剤	0.3
香料	1.0
重曹にてpH6.9に調整	
合計	1000

(単位:g)

【0025】試料調製直後に官能評価を行った結果を下記表5に示す。

【0026】

【表5】

※

評価

試料1	(コントロール)
試料2	コントロールと同様の香味
試料3	コントロールと同様の香味
試料4	異味、異臭なく正常な香味
試料5	コーヒーのロースト感がアップし、わずかに塩味
試料6	コーヒー感に欠け、塩味が強く全体のトーンが単調

【0027】以上の結果より、コーヒー飲料全量に対するキシロースとグリシンのコーヒー香味に影響を与えない最大添加量は0.92重量%(試料5)、最低添加量は0.018重量%(試料2)と判断された。

【0028】(2) 単糖とアミノ酸の組み合わせ

基本処方(表3)に、単糖としてキシロース(Xyl)またはグルコース(Glc)、アミノ酸としてグリシン(Gly)、アラニン(Ala)、イソロイシン(Ile)、またはロイシン(Leu)、バリン(Val)を表6に示す割合で添加し、試験試料を調製した。

40★【表6】

糖		アミノ酸	
Xyl	1.22	Gly	0.61
		Ala	0.72
		Ile	1.06
		Leu	1.06
		Val	0.95
Glc	1.00	Gly	0.42
		Ala	0.50
		Ile	0.73
		Leu	0.73
		Val	0.65

[配合量は全量 1000g当たりの量(g)]

【0029】

【0030】試料調製直後に官能評価を行った結果を表7に示す。 \* 【0031】

\* 【表7】

評価	
Gly	製品の香味には大きな影響を与えず異味がない
Ala	後口に僅かにアミノ酸の味が出るが、製品の香味には大きな影響はない
Ile	コーヒーとは異なる苦みがあり、粉っぽく全体のトーンがぼやける
Leu	強い酸臭を伴うアミノ酸臭がある
Val	人工的な甘味があり、ざらつきがでる

【0032】上記の結果より、コーヒー香味に影響を与えずに使用できるアミノ酸としては、グリシン(Gly)が最も好ましく、アラニン(Ala)も好ましいと判断できる。単糖はキシロース(Xyl)、グルコース(Glc)いずれも使用できる。

【0033】〔試験例4〕 ミルク入りコーヒー飲料の官能評価(2)

基本処方(表3)のもの、および基本処方にキシロース(Xyl)を1.22g、グリシン(Gly)を0.61g添加したものをそれぞれ調製した。これらを55℃、2カ月間保存し、冷蔵庫保存品をコントロールとして11名のパネラーにより官能評価を行った。乳の「すえ臭」については、基本処方では55%のパネラーがコントロールに比べて“非常に強い”または“かなり強い”と評価したのに対し、Xyl-Gly添加処方では9%にまで低下した。逆に、“差がない”と評価した割合も18から27%まで増加した。また、乳の「むれっばさ」についても基本処方では18%のパネラーがコントロールに比べて“非常に強い”または“か※

※なり強い”と評価したのに対し、Xyl-Gly添加処方ではこれらの評価はなくなり、“差がない”または“弱い”と評価したパネラーが36%に増え、香味の改善がはかられていることがわかった(図2)。

【0034】

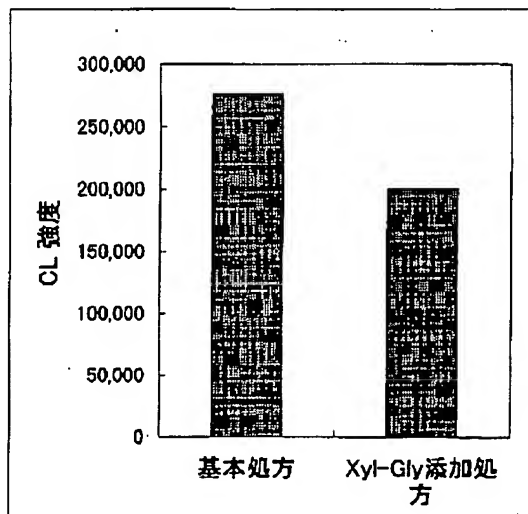
【発明の効果】本発明によれば、加温状態でも長期間にわたり香味劣化のないミルク入りコーヒー飲料が提供される。従って、冬季に加温状態で販売されているミルク入り缶コーヒーについての保存期間の延長が可能となるので、商品管理に要する努力の削減、商品の廃棄率の低下に役立つ。

【図面の簡単な説明】

【図1】本発明によるミルク入りコーヒー飲料の加温状態での長期間保存(55℃、2カ月)後の化学発光(CL)強度を示す。

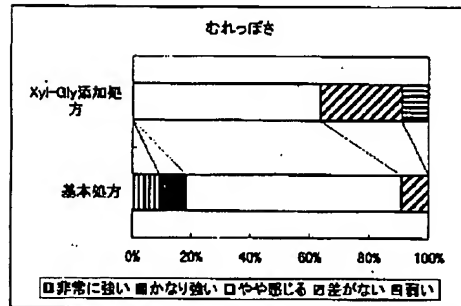
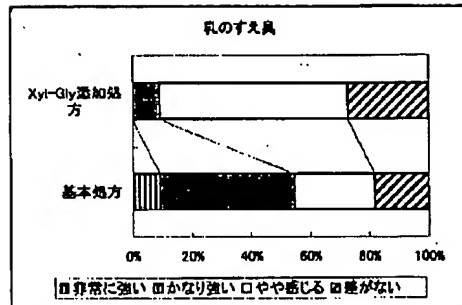
【図2】本発明によるミルク入りコーヒー飲料の官能評価結果を示す。

【図1】





【図2】



## CLAIMS

### [Claim(s)]

[Claim 1] The manufacture method of the coffee drink containing milk which adds a monosaccharide and amino acid to the coffee extract containing sugar, blends a milk component with it further, and is characterized by carrying out retort sterilization after filling up a container.

[Claim 2] The way according to claim 1 the combination of a monosaccharide and amino acid is the combination chosen from a xylose, a glycine, a glucose and a glycine or a xylose, and an alanine.

[Claim 3] The addition to the coffee drink whole quantity of a monosaccharide and amino acid is 0.01-1.0. The method according to claim 1 of being weight %.

[Claim 4] The way according to claim 1 the mixing ratios of a monosaccharide and amino acid are 1:2-2:1 (mole ratio).

[Claim 5] The coffee drink containing milk which adds a monosaccharide and amino acid to the coffee extract containing sugar, blends a milk component with it further, and is characterized by carrying out retort sterilization after filling up a container.

## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

#### [0001]

[The technical field to which invention belongs] this invention -- warming -- it is related with the coffee drink containing milk which does not have flavor degradation over a long period of time, and its manufacture method also in the state

#### [0002]

[Description of the Prior Art] the canned coffee containing milk -- a winter season -- warming -- state (55-60 degrees C) \*\*\*\* -- it is the year-round quotient material sold, and the big wait also in the sales of soft drinks is occupied the canned coffee containing milk has stable quality 12 months or more in ordinary temperature -- receiving -- warming -- it

is known that the flavor of a product will deteriorate quickly also in a state therefore -- in order to maintain the flavor of the canned coffee containing milk -- warming -- as not saved in the state for a long period of time, the present condition is that strict merchandise management of managing the time which is piling up with the vending machine, and discarding the product after progress during a fixed period is performed this warming -- in respect of the scent, it is specifically considered to be the cause in respect of generating of a degradation smell (end smell) peculiar to milk, and the taste flavor degradation of the canned coffee containing milk in a state and milk fat, coffee fats and oils, etc. peculiar to milk with which it crowds together, and generating of \*\*\*\*\* and a milk component are deep and disappearance of the taste (creamy feeling) is included in milk components, such as cow's milk, cause complicated oxidation reaction by warming, and change this warming -- although it is possible to add an anti-oxidant in order to suppress oxidation reaction of inner milk fat, safety is high, it is the natural-product origin, and there are few anti-oxidants which moreover do not affect the taste of coffee, and anti-oxidizing power cannot be expected in addition of the minute amount of a grade which does not affect the taste On the other hand, it is known that the sugar-amino acid browning matter, i.e., a Maillard-reaction product, has an anti-oxidization operation (JP,61-40277,B, JP,5-65482,A). . For example, using the browning matter of a leucine, a xylose and an isoleucine, a xylose and a valine, and a glucose, the oxidization deterioration of fats and oils and fats-and-oils content food is prevented, and the attempt which carries out the maintenance improvement of those flavors simultaneously is made (JP,45-28899,B). .

[0003]

[Problem(s) to be Solved by the Invention] therefore, the purpose of this invention -- warming -- it is in offering also in the state the coffee drink containing milk which does not have flavor degradation over a long period of time, and its manufacture method

[0004]

[Means for Solving the Problem] this invention persons make this Maillard-reaction product exist in a coffee extract paying attention to the Maillard-reaction product it is expected that it is that anti-oxidizing power is strong and does not affect the taste of coffee as a result of repeating research wholeheartedly, in order to solve the above-mentioned technical problem -- warming -- it finds out that flavor degradation of the coffee drink containing milk in a state can be suppressed, and came to complete this invention

[0005] That is, this inventions are the coffee drink containing milk which adds a monosaccharide and amino acid to the coffee extract containing sugar, blends a milk component with it further, and is characterized by carrying out retort sterilization after filling up a container, and its manufacture method. Hereafter, this invention is explained in detail.

[0006]

[Embodiments of the Invention] In this invention, the coffee extract blended with the coffee drink containing milk extracts coffee roast beans, and is obtained. Although especially the kind of coffee beans is not limited, Brazil, Colombia, Tanzania, mocha, etc.

are mentioned, for example. The number of coffee beans one, or they may blend and use two or more sorts. What is necessary is for the taste for which it asks just to adjust the grade of roast suitably that what is necessary is just to perform roast by the usual method. Specifically, if roast is made deep, bitterness will become strong, and acidity will become strong if roast is shallow. Although especially the extraction method of coffee roast beans is not limited, it is performed, for example by hot water extraction.

[0007] Specifically in this invention, the milk component blended with the coffee drink containing milk says fresh milk, cow's milk, dry whole milk, skim milk powder, whipped cream, concentrated milk, a skim milk, a partial skim milk, \*\*\*\*\*, etc.

[0008] In this invention, a monosaccharide and amino acid are added to a coffee extract. As for a monosaccharide, a glucose, a xylose, etc. are mentioned. Moreover, as for amino acid, a glycine, an alanine, a leucine, an isoleucine, a valine, etc. are mentioned. Although the mixture which consists of these monosaccharides and amino acid produces a Maillard-reaction product by heating, as the combination, a xylose, a glycine and a xylose, an alanine and a glucose, and its glycine are desirable.

[0009] the above-mentioned monosaccharide and the mixing ratio of amino acid -- 1 [ for example, ] : the thing of 2-2:1 (mole ratio) which it comes out comparatively and is used -- desirable -- both components -- the coffee drink whole quantity -- receiving -- 0.01-1.0 weight % -- desirable -- 0.15-0.9 Weight % comes out comparatively and it is made to contain.

[0010] In this invention, cane sugar, fruit-sugar grape-sugar liquid sugar, a starch syrup, a maltose, a lactose, a paratinose, and various oligosaccharides are used as sugar other than the above-mentioned monosaccharide. moreover, the above-mentioned monosaccharide -- the sugar whole quantity -- 0.1-7.0 weight % -- desirable -- 1.0-6.0 Weight % comes out comparatively and it is made to contain.

[0011] Furthermore, to the coffee drink containing milk in this invention, pH regulator, an emulsifier, perfume, etc. can be added as an auxiliary material. Although especially limitation will not be carried out if pH regulator can prevent precipitation generation of the milk protein by heat sterilization, sodium bicarbonate is used suitably, for example. Although it will not be limited especially if precipitation generation of the milk protein by heat sterilization and separation of a fat can be prevented as an emulsifier, sucrose fatty acid ester, a glycerine fatty acid ester, and a microcrystal cellulose are used suitably, for example.

[0012] As the manufacture method of the coffee drink containing milk of this invention, specifically, after adding the sugar of the specified quantity, for example, cane sugar, to a coffee extract and making it dissolve in it, an above-mentioned monosaccharide and above-mentioned amino acid are added, and it is pH with sodium bicarbonate 6.8-7.1 It adjusts. Furthermore, after adding an emulsifier, a milk component and perfume are added and it considers as coffee preparation liquid. After a temperature up, homogenization processing is carried out, 90 more degrees C is filled up with this after a temperature up and at a container, and it carries out retort sterilization to 60-70 degrees C. Retort sterilization is performed in 10-60F for 115 - 130 \*\* and 15 - 30 minutes. As a container

used here, they are a can (aluminum, steel) and a bottle (glass), for example.

[0013] A Maillard reaction occurs by the monosaccharide and amino acid automatically in a container, and a Maillard-reaction product is made into the above-mentioned retort sterilization. It is more effective from supply of a raw material or the field of operability to prepare a Maillard-reaction product in retort sterilization as mentioned above, although the Maillard-reaction product is prepared separately beforehand, this may be added to a coffee extract and you may retort after that.

[0014]

[Example] Although an example is given and this invention is explained concretely hereafter, this invention is not limited to these.

[0015] [Example 1] Extraction was performed for 15 minutes by the 90-degree C hot water of an amount 14 times, performing stirring, after grinding the Brazil beans in which the coffee drink containing milk carried out manufacture roast. The extract was filtered by the barrier filter made of commercial paper after the extraction end, and filtrate was ice-cooled. the fusibility solid content (Brix; Brix) of the obtained liquid (henceforth, coffee extract) -- 2.3 it is -- extractability -- 25% it was . It is 1000g about this coffee extract. The amount of the coffee roast beans used in prescription is 52g. Weighing capacity was carried out so that it might become. To this extract, it is [ cane sugar ] 0.61g about 1.22g and a glycine in 61g and a xylose. Sodium bicarbonate is added and it is pH, after adding and dissolving completely 6.9 It adjusted. It added, after dissolving 0.3g of sucrose fatty acid ester in this as an emulsifier. Subsequently, 120g and 1g of perfume were added, and cow's milk was used as preparation liquid. Homogenization processing (primary \*\* 150 kg/cm<sup>2</sup>, 50kg [/cm ] secondary \*\*kg [ of 2 / a total of 200 //cm ] 2) of this preparation liquid was carried out, it homogenized, 90 degrees C was filled up after the temperature up at the can, and the deed (for 124 degrees C and 20 minutes and F= 39) and the target coffee drink containing milk were obtained for retort sterilization.

[0016] [Example 1 of an examination] Antioxidation ability examination of a Maillard-reaction product (1)

(1) They are a xylose (Xyl) or a glucose as a manufacture monosaccharide of a Maillard-reaction product. (Glc) They are a glycine (Gly), an alanine (Ala), an isoleucine (Ile), a leucine (Leu), or a valine (Val) as amino acid. It is 1:1 at a mole ratio. It is a phosphoric-acid buffer (pH 7.0) so that it may mix so that it may become, and final concentration may be set to 25mM(s). It added and dissolved completely. Then, 124 degree-C 20 Heating between parts was performed and the Maillard reaction was performed. After the heating end, this was made into the Maillard-reaction product, after cooling promptly.

(2) 99.5% of calculation of the peroxide number (P. O.V.) Ethanol 2ml, To 2.5% linolic acid / ethanol 2ml, and 50mM phosphoric-acid buffer (pH 7.0) 4ml, as a commercial antioxidant Vitamin E, Burylhydroxyanisole (BHA), butylhydroxytoluene (BHT), 200 ppm and the above-mentioned Maillard-reaction product are added for a propyl gallate (PG) (a monosaccharide is set to 1000 ppm like). After setting the whole quantity to 10ml, it puts into the screw vial, and it is 8 at 55 degrees C. It saved during the day and this was made into the sample solution. 0.05ml of sample solutions is extracted from the saved screw

vial, this is put into a test tube, and it is 75%. It is [ 4.85ml and ] ethanol 30% 0.05ml of ammonium-thiocyanate solutions was added.

## TECHNICAL FIELD

[The technical field to which invention belongs] this invention -- warming -- it is related with the coffee drink containing milk which does not have flavor degradation over a long period of time, and its manufacture method also in the state

## PRIOR ART

[Description of the Prior Art] the canned coffee containing milk -- a winter season -- warming -- state (55-60 degrees C) \*\*\*\* -- it is the year-round quotient material sold, and the big wait also in the sales of soft drinks is occupied the canned coffee containing milk has stable quality 12 months or more in ordinary temperature -- receiving -- warming -- it is known that the flavor of a product will deteriorate quickly also in a state therefore -- in order to maintain the flavor of the canned coffee containing milk -- warming -- as not saved in the state for a long period of time, the present condition is that strict merchandise management of managing the time which is piling up with the vending machine, and discarding the product after progress during a fixed period is performed this warming -- in respect of the scent, it is specifically considered to be the cause in respect of generating of a degradation smell (end smell) peculiar to milk, and the taste flavor degradation of the canned coffee containing milk in a state and milk fat, coffee fats and oils, etc. peculiar to milk with which it crowds together, and generating of \*\*\*\*\* and a milk component are deep and disappearance of the taste (creamy feeling) is included in milk components, such as cow's milk, cause complicated oxidation reaction by warming, and change this warming -- although it is possible to add an anti-oxidant in order to suppress oxidation reaction of inner milk fat, safety is high, it is the natural-product origin, and there are few anti-oxidants which moreover do not affect the taste of coffee, and anti-oxidizing power cannot be expected in addition of the minute amount of a grade which does not affect the taste On the other hand, it is known that the sugar-amino acid browning matter, i.e., a Maillard-reaction product, has an antioxidation operation (JP,61-40277,B, JP,5-65482,A). For example, using the browning matter of a leucine, a xylose and an isoleucine, a xylose and a valine, and a glucose, the oxidization deterioration of fats and oils and fats-and-oils content food is prevented, and the attempt which carries out the maintenance improvement of those flavors simultaneously is made (JP,45-28899,B).

## EFFECT OF THE INVENTION

[Effect of the Invention] according to this invention -- warming -- the coffee drink containing milk which does not have flavor degradation over a long period of time is offered also in the state therefore, winter -- warming -- since it becomes extensible [ the retention period about the canned coffee containing milk currently sold in the state ], it is useful to decline in curtailment of the efforts which merchandise management takes, and the rate of abandonment of goods

## TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] therefore, the purpose of this invention -- warming -- it is in offering also in the state the coffee drink containing milk which does not have flavor degradation over a long period of time, and its manufacture method

## MEANS

[Means for Solving the Problem] this invention persons make this Maillard-reaction product exist in a coffee extract paying attention to the Maillard-reaction product it is expected that it is that anti-oxidizing power is strong and does not affect the taste of coffee as a result of repeating research wholeheartedly, in order to solve the above-mentioned technical problem -- warming -- it finds out that flavor degradation of the coffee drink containing milk in a state can be suppressed, and came to complete this invention

[0005] That is, this inventions are the coffee drink containing milk which adds a monosaccharide and amino acid to the coffee extract containing sugar, blends a milk component with it further, and is characterized by carrying out retort sterilization after filling up a container, and its manufacture method. Hereafter, this invention is explained in detail.

[0006]

[Embodiments of the Invention] In this invention, the coffee extract blended with the coffee drink containing milk extracts coffee roast beans, and is obtained. Although especially the kind of coffee beans is not limited, Brazil, Colombia, Tanzania, mocha, etc. are mentioned, for example. The number of coffee beans one, or they may blend and use two or more sorts. What is necessary is for the taste for which it asks just to adjust the

grade of roast suitably that what is necessary is just to perform roast by the usual method. Specifically, if roast is made deep, bitterness will become strong, and acidity will become strong if roast is shallow. Although especially the extraction method of coffee roast beans is not limited, it is performed, for example by hot water extraction.

[0007] Specifically in this invention, the milk component blended with the coffee drink containing milk says fresh milk, cow's milk, all milk powder, skimmilk powder, whipped cream, concentrated milk, a skimmilk, a partial skimmilk, \*\*\*\*\*, etc.

[0008] In this invention, a monosaccharide and amino acid are added to a coffee extract. As for a monosaccharide, a glucose, a xylose, etc. are mentioned. Moreover, as for amino acid, a glycine, an alanine, a leucine, an isoleucine, a valine, etc. are mentioned. Although the mixture which consists of these monosaccharides and amino acid produces a Maillard-reaction product by heating, as the combination, a xylose, a glycine and a xylose, an alanine and a glucose, and its glycine are desirable.

[0009] the above-mentioned monosaccharide and the mixing ratio of amino acid -- 1 [ for example, ] : the thing of 2-2:1 (mole ratio) which it comes out comparatively and is used -- desirable -- both components -- the coffee drink whole quantity -- receiving -- 0.01-1.0 weight % -- desirable -- 0.15-0.9 Weight % comes out comparatively and it is made to contain.

[0010] In this invention, cane sugar, fruit-sugar grape-sugar liquid sugar, a starch syrup, a maltose, a lactose, a paratinose, and various oligosaccharides are used as sugar other than the above-mentioned monosaccharide. moreover, the above-mentioned monosaccharide -- the sugar whole quantity -- 0.1-7.0 weight % -- desirable -- 1.0-6.0 Weight % comes out comparatively and it is made to contain.

[0011] Furthermore, to the coffee drink containing milk in this invention, pH regulator, an emulsifier, perfume, etc. can be added as an auxiliary material. Although especially limitation will not be carried out if pH regulator can prevent precipitation generation of the milk protein by heat sterilization, sodium bicarbonate is used suitably, for example. Although it will not be limited especially if precipitation generation of the milk protein by heat sterilization and separation of a fat can be prevented as an emulsifier, sucrose fatty acid ester, a glycerine fatty acid ester, and a microcrystal cellulose are used suitably, for example.

[0012] As the manufacture method of the coffee drink containing milk of this invention, specifically, after adding the sugar of the specified quantity, for example, cane sugar, to a coffee extract and making it dissolve in it, an above-mentioned monosaccharide and above-mentioned amino acid are added, and it is pH with sodium bicarbonate 6.8-7.1 It adjusts. Furthermore, after adding an emulsifier, a milk component and perfume are added and it considers as coffee preparation liquid. After a temperature up, homogenization processing is carried out, 90 more degrees C is filled up with this after a temperature up and at a container, and it carries out retort sterilization to 60-70 degrees C. Retort sterilization is performed in 10-60F for 115 - 130 \*\* and 15 - 30 minutes. As a container used here, they are a can (aluminum, steel) and a bottle (glass), for example.

[0013] A Maillard reaction occurs by the monosaccharide and amino acid automatically in



a container, and a Maillard-reaction product is made into the above-mentioned retort sterilization. It is more effective from supply of a raw material or the field of operability to prepare a Maillard-reaction product in retort sterilization as mentioned above, although the Maillard-reaction product is prepared separately beforehand, this may be added to a coffee extract and you may retort after that.

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] warming of the coffee drink containing milk by this invention -- the chemiluminescence (CL) intensity after prolonged preservation (55 degrees C, 2 mosquito moons) in the state is shown

[Drawing 2]The organic-functions evaluation result of the coffee drink containing milk by this invention is shown.

## EXAMPLE

[Example] Although an example is given and this invention is explained concretely hereafter, this invention is not limited to these.

[0015] [Example 1] Extraction was performed for 15 minutes by the 90-degree C hot water of an amount 14 times, performing stirring, after grinding the Brazil beans in which the coffee drink containing milk carried out manufacture roast. The extract was filtered by the barrier filter made of commercial paper after the extraction end, and filtrate was ice-cooled. the fusibility solid content (Brix; Brix) of the obtained liquid (henceforth, coffee extract) -- 2.3 it is -- extractability -- 25% it was. It is 1000g about this coffee extract. The amount of the coffee roast beans used in prescription is 52g. Weighing capacity was carried out so that it might become. To this extract, it is [ cane sugar ] 0.6 about 1.22g and a glycine in 61g and a xylose. Sodium bicarbonate is added and it is pH, after adding and dissolving completely 6.9 It adjusted. It added, after dissolving 0.3g of sucrose fatty acid ester in this as an emulsifier. Subsequently, 120g and 1g of perfume were added, and cow's milk was used as preparation liquid. Homogenization processing (primary \*\* 150 kg/cm<sup>2</sup>, 50kg [ /cm ] secondary \*\*kg [ of 2 / a total of 200 //cm ] 2) of this preparation liquid was carried out, it homogenized, 90 degrees C was filled up after the temperature up at the can, and the deed ( 124 degrees C and 20 minutes and F= 39) and the target coffee drink containing milk were obtained for retort sterilization.

[0016] [Example 1 of an examination] Antioxidation ability examination of a Maillard-reaction product (1)  
(1) They are a xylose (Xyl) or a glucose as a manufacture monosaccharide of a Maillard-reaction product. (Glc) The are a glycine (Gly), an alanine (Ala), an isoleucine (Ile), a leucine (Leu), or a valine (Val) as amino acid. It is 1:1 at a mole ratio. It is a phosphoric-acid buffer (pH 7.0) so that it may mix so that it may become, and final concentration may be set to 25mM(s). It added and dissolved completely. Then, 124 degree-C 20 Heating between parts was performed and the Maillard reaction was performed. After the heating end, this was made into the Maillard-reaction product, after cooling promptly.

(2) 99.5% of calculation of the peroxide number (P. O.V.) Ethanol 2ml, To 2.5% linolic acid / ethanol 2ml, and 50mM phosphoric-acid buffer (pH 7.0) 4ml, as a commercial anti-oxidant Vitamin E, Burylhydroxyanisole (BHA), butylhydroxytoluene (BHT), 200 ppm and the above-mentioned Maillard-reaction product are added for a propyl gallate (PG) (a monosaccharide is set to 1000 ppm like). After setting the whole quantity to 10ml, it puts into the scr vial, and it is 8 at 55 degrees C. It saved during the day and this was made into the sample solution. 0.05ml of sample solutions is extracted from the saved screw vial, this is put into a test tube, and it is 75%. It is [ 4.85ml and ] ethanol 30% 0.05ml of ammonium-thiocyanate solutions was added. In addition to [ 0.05ml of solution of hydrochloric acid these mixed liquor, it stirs for 15 seconds 20mM ferrous chloride / 3.5%, and is 3 correctly. It is 500mm after a part. The absorbance was measured. This measuring method is the red matter [Fe 3+(SCN)3-] which rhodan liquid and fe chloride reacted and was produced. Colorimetry is carried out, and from the standard straight line of Fe created independently, the amount of Fe(s) was converted and it computed as the peroxide number (P. O.V.). The result is shown in the following table 1.

[0017]

[Table 1]

抗酸化性試験物質		過酸化価(P.O.V.)
(メイラード反応生成物)		
糖	アミノ酸	
	Gly	0.27
	Ala	0.27
	Leu	0.39
	Ile	0.35
	Val	0.32
Glc	Gly	0.16
	Ala	0.36
	Leu	0.53
	Ile	0.84
	Val	0.31
コントロール		3.12
BHT		0.17
BHA		0.47
PG		0.28

[0018] From the above result, it is a xylose (Xyl) among Maillard-reaction products. A glycine (Gly) and glucose (G A glycine (Gly) and xylose (Xyl) Alanine (Ala) It turns out that especially combination is effective.

[0019] [Example 2 of an examination] Anti-oxidization ability examination of a Maillard-reaction product (2) Xylose (Xyl) Glycine (Gly) It uses, a coffee drink is prepared by the blending ratio of coal of the following table 2, a it is this at 55 degrees C 2 Chemiluminescence (CL) intensity was measured after mosquito moon preservation. Chemiluminescence (CL) intensity is 5ml of drinks to a sample room. It measured correctly and computed by integrating CL which keeps this at 40 degrees C and is measured in 5 minutes. The result is shown in drawing 1.

[0020]

[Table 2]

基本処方	Xyl-Gly 添加処方
コーヒー豆	52.0
牛乳	120.0
シヨ糖	61.0
乳化剤	0.30
香料	1.00
重曹にてpH 6.9に調整	
キシロース(Xyl)	0
グリシン(Gly)	0
合計	1000

(単位:g)

[0021] By drawing 1, it is Xyl-Gly. As for addition prescription, it is shown that the degree of oxidization is notably suppressed compared with basic prescription.

[0022] [Example 3 of an examination] Organic-functions evaluation of the coffee drink containing milk (1)

(1) To the amount-used range basic prescription (Table 3) of a monosaccharide and amino acid, it is a xylose (Xyl). Glycine (Gly) It added at a rate shown in Table 4, and the sample was prepared.

[0023]

[Table 3]

(基本処方)

シヨ糖	61
殺菌乳	120
コーヒー豆	52
乳化剤	0.3
香料	1.0
重曹にてpH6.9 に調整	
合計	1000

(単位:g)

[0024]

[Table 4]

	Xyl	Gly
試料1	0	0
試料2	0.122	0.061
試料3	0.61	0.305
試料4	1.22	0.61
試料5	6.10	3.05
試料6	12.2	6.10

(単位:g)

[0025] The result which performed organic-functions evaluation immediately after sample preparation is shown in the following table 5.

[0026]

[Table 5]

評価
試料1 (コントロール)
試料2 コントロールと同様の香味
試料3 コントロールと同様の香味
試料4 異味、異臭なく正常な香味
試料5 コーヒーのロースト感がアップし、わずかに塩味
試料6 コーヒー感に欠け、塩味が強く全体のトーンが単調

[0027] The minimum addition was judged to be 0.018 % of the weight (sample 2) 0.92% of the weight (sample 5) for the maximum addition which does not affect the coffee flavor of a xylose and a glycine to the coffee drink whole quantity from the above result.

[0028] (2) combination basic prescription (Table 3) of a monosaccharide and amino acid -- as a monosaccharide -- xylose (Xyl) or -- as a glucose (Glc) and amino acid -- a glycine (Gly), an alanine (Ala), an isoleucine (Ile) or a leucine (Leu), and valine (Val) It added at a rate shown in Table 6, and the test sample was prepared.

[0029]

[Table 6]

糖		アミノ酸	
Xyl	1.22	Gly	0.61
		Ala	0.72
		Ile	1.06
		Leu	1.06
		Val	0.95
Glc	1.00	Gly	0.42
		Ala	0.50
		Ile	0.73
		Leu	0.73
		Val	0.65

[配合量は全量 1000g当たりの量(g)]

[0030] The result which performed organic-functions evaluation immediately after sample preparation is shown in Table 7.

[0031]

[Table 7]

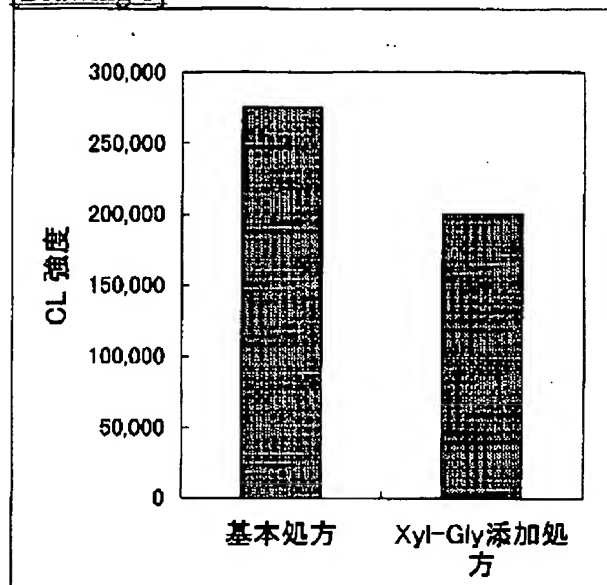
評価	
Gly	製品の香味には大きな影響を与えず異味がない
Ala	後口に僅かにアミノ酸の味が出るが、製品の香味には大きな影響はない
Ile	コーヒーとは異なる苦みがあり、粉っぽく全体のトーンがぼやける
Leu	強い酸臭を伴うアミノ酸臭がある
Val	人工的な甘味があり、ざらつきがでる

[0032] As amino acid which can be used from the above-mentioned result, without affecting a coffee flavor, it is a glycine (Gly). It is the most desirable and is an alanine (Ala). It can be judged that it is desirable. A monosaccharide a xylose (Xyl) and a glucose (Glc). All can be used.

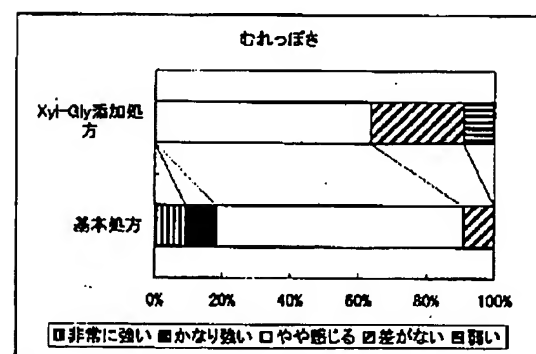
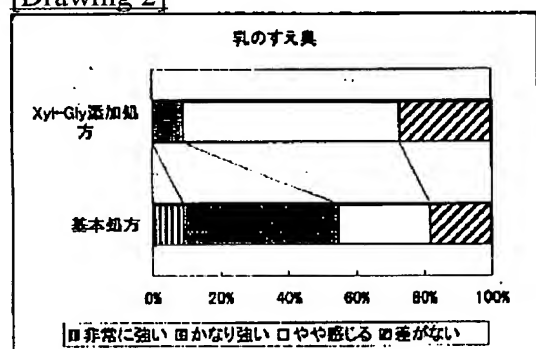
[0033] [Example 4 of an examination] Organic-functions evaluation of the coffee drink containing milk (2) It is a xylose (Xyl) to the thing of basic prescription (Table 3), and basic prescription. 1.22g and glycine (Gly) What was added 0.61g was prepared, respectively. They are these 55 degrees C and 2 Mosquito month-long preservation was carried out and 11 persons' panelist performed organic-functions evaluation by considering a refrigerator preservation article as control. About the "end smell" of milk, it is 55% by basic prescription. A panelist compares with control and it is Xyl-Gly to "it being very strong" or having estimated "It is quite strong". In addition prescription, it fell even to 9%. On the contrary, it increased from the rate 18 estimated "There is no difference" to 27%. Moreover, by basic prescription, it is 18% also about "\*\*\*\*\*" of milk. A panelist compares with control and it is Xyl-Gly to "it be very strong" or having estimated "It is quite strong". These evaluations are lost in addition prescription and there "the being no difference" or the panelist who estimated "It is weak" is 36%. It turns out that it increases and the improvement of a flavor is aimed at ( drawing 2 ).

## DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]